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NASA Funds UNH Scientists to Develop Miniaturized Space Instruments

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DURHAM, N.H. – Physicists from the University of New Hampshire's Space Science Center have been funded by NASA to develop key technological components needed for instruments on board next-generation small research satellites known as "CubeSats."

The three-year, $369,948 competitive grant was awarded through NASA's Experimental Program to Stimulate Competitive Research, or EPSCoR, Research Infrastructure Development (RID) program. The project involves three scientists from the UNH Institute the Study of Earth, Oceans, and Space and department of physics, two collaborators from Dartmouth College, and several regional industrial partners.

The project's principal investigator is research professor Antoinette Galvin, who also serves as the director for the New Hampshire NASA EPSCoR program headquartered at UNH. NASA EPSCoR establishes partnerships with government, higher education, and industry that are designed to effect lasting improvements in a state's or region's research infrastructure and R&D capacity. In addition to the research and technology development, the awards enable faculty development and higher education student support.

For the multifaceted RID project, associate professor Marc Lessard is lead scientist for work aimed at developing miniaturized instrumentation for a magnetometer that could fly on pint-sized CubeSat satellite missions. Associate professor James Connell will lead work to develop scaled-down electronics to support high-energy particle instruments similar to ones he and colleagues have developed for standard-sized spacecraft.

The Dartmouth co-investigators, professor Kristina Lynch (formerly of UNH) and associate professor Robyn Millan, will further ongoing technology development directed towards the goal of an orbiting "swarm" of multiple CubeSats that will work together to make multipoint investigations of geospace phenomena.

"NASA's EPSCoR program allows our state to build up technical and scientific expertise and internal infrastructure to face the challenges of today's competitive research," says Galvin. "The program is noteworthy in that our partnerships include the practice of pledging matching funds and an emphasis on promoting student participation in, for example, CubeSat development—a key component of our RID programs at UNH and at Dartmouth College."

The innovative 10x10x10-centimeter CubeSat satellites, which are generally auxiliary payloads on previously planned missions, provide low-cost, ready access to space exploration for university graduate students and researchers. UNH is currently working on the FIREBIRD (Focused Investigations of Relativistic Electron Burst Intensity, Range, and Dynamics) CubeSat mission slated for launch in 2013.

EPSCoR was established by the National Science Foundation (NSF) in 1979, with a goal of strengthening U.S. research and education in science and engineering. NSF designated New Hampshire an EPSCoR state in 2004, and in 2007 the state became eligible for NASA EPSCoR funding. Since then, in addition to the recent RID funding, research awards totaling over $2,740,000 under the administration of UNH have come to the state through the NASA program, including another recent award for $744,432 for research on the effects of microgravity on the human eye that is led by Jay Buckey, professor of medicine at the Geisel School of Medicine at Dartmouth.

To view the NH NASA EPSCoR website, visit http://www.nasaepscor.unh.edu.

The University of New Hampshire, founded in 1866, is a world-class public research university with the feel of a New England liberal arts college. A land, sea, and space-grant university, UNH is the state's flagship public institution, enrolling 12,200 undergraduate and 2,300 graduate students.

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